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SUBJECT: LER 90-008-00:on 900327,Tech Spec noncompliance due to installation of oversized circuit breaker.
W/9 ltr.

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NOTES:Application for permit renewal filed. 05000400

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R. B. RICHEY
Manager
Harris Nuclear Project

APR 26 1990

Letter Number: HO-900087 (O)

U.S. Nuclear Regulatory Commission
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SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400
LICENSE NO. NPF-63
LICENSEE EVENT REPORT 90-008-00

Gentlemen:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is in accordance with the format set forth in NUREG-1022, September 1983.

Very truly yours,

R. B. Richey, Manager
Harris Nuclear Project

RBR:dgr

Enclosure

cc: Mr. R. A. Becker (NRR)
Mr. S. D. Ebneter (NRC - RII)
Mr. J. E. Tedrow (NRC - SHNPP)

MEM/LER-90-008/1/OS1

IE22
1/1

NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
SHEARON HARRIS NUCLEAR POWER PLANT	0 5 0 0 0 4 0 0	1 OF 0 4

TITLE (4) TECHNICAL SPECIFICATION NON-COMPLIANCE DUE TO INSTALLATION OF OVERSIZED CIRCUIT BREAKER

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 3	2 7	9 0	9 0	0 0 8	0 0	0 4	2 6	9 0	N/A	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)								
1	1 0 0	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)		
		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)		
		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
		20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)				
		20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)				
		20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)				

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Andrew Howe - Senior Specialist	AREA CODE 9 1 9 3 6 2 - 2 7 1 9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

Abstract:

On March 14, 1990, with the plant operating at 100% power, a discrepancy in the amperage rating for a circuit breaker providing overcurrent protection for a containment penetration conductor was discovered during an engineering review of design calculation margins for these circuits. The required amperage rating per the Technical Specification Equipment List Program and Specification 3.8.4.1 was 15 amps, while a 30 amp breaker was actually installed in the circuit. A review of the calculation subsequently determined on March 27 that the 30 amp breaker could not provide overcurrent protection to ensure the mechanical integrity of the containment penetration in the event of an electrical fault.

The circuit breaker provides the backup protection, while the primary protection is provided by in series fuses to individual loads on the circuit. The breaker was declared inoperable when discrepancy between the Technical Specification and the actual installed breaker size was discovered, at 0900 on March 16, 1990, and Specification 3.8.4.1 action requirements were applied.

The circuit breaker had been upsized to 30 amps from the original 15 amp design in October 1985, prior to the licensing of the plant. The design change documentation did not consider containment penetration overcurrent protection, resulting in the design deficiency.

The circuit was redesigned with additional in series fuses to provide the backup overcurrent protection, so that the 30 amp breaker is no longer used to provide the protection. The Technical Specification Equipment List Program has been revised to reflect the new design of the circuit. Further reviews of other similar circuits are being conducted, and no other discrepancies have been discovered in the reviews conducted to date.

Event Description:

On March 14, 1990, a verification of design calculation margins for 120/208 volt molded case electrical circuit breakers used for protection of containment electrical penetration conductors from overcurrent conditions was being performed. The purpose of this review was to determine if the calculation margins permitted increased tolerance in acceptance criteria for breaker testing. Engineering personnel performing this review discovered that the backup protection breaker for circuit 1B311-SB-3 had not been properly verified as capable of performing this protective function.

A 30 amp breaker was installed in this circuit as the backup protection for the containment penetration. Smaller amperage fuses are installed in series with this breaker to provide the primary protection device for the individual penetration conductors for each electrical load inside the containment. Technical Specification 3.8.4.1 requires both primary and secondary protection devices to be operable, and the Technical Specification Equipment List Program contained in plant procedure PLP-106 identifies this circuit breaker as having a 15 amp rating rather than the installed 30 amp rating.

Upon discovery of the discrepancy between the Technical Specification requirements and the actual breaker size, at 0900 on March 16, the installed breaker for circuit 1B311-SB-3 was declared inoperable, and the action requirements of Specification 3.8.4.1 were applied. A design change was developed to provide additional in series fuses in the circuit to provide backup protection within design limits for the containment penetration conductors. On March 19 at 1615, the new fuses were installed, and the Technical Specification Equipment List Program was revised to reflect the new design of the circuit. The action statement for Specification 3.8.4.1 was exited, and the circuit was again operable.

The plant operated at 100% power throughout the event.

Further evaluation of the circuit protection with a 30 amp breaker instead of a 15 amp breaker concluded, on March 27, that overcurrent protection of the penetration conductor would not be achieved by a 30 amp breaker.

Cause:

The original circuit design required a 15 amp breaker. In October 1985, prior to the licensing of the plant, a design change was made based on the results of a study, "Shearon Harris Nuclear Power Plant Voltage Drop and Availability

Study at 208/120 Volt Class 1E Power Panels" conducted by Ebasco Services, the plant architect/engineer. The design change to increase the amperage rating of the circuit breaker from 15 amps to 30 amps, and to increase the size of the cable in this circuit, did not identify the requirement for overcurrent protection of the containment penetration conductors. Because of this oversight, calculations were not made to determine if the circuit would provide adequate backup protection to the containment penetration conductor, and the change to a 30 amp breaker was not reflected in the Technical Specifications issued with the low power Operating License.

The listing of electrical circuits associated with Specification 3.8.4.1 was relocated to the Technical Specification Equipment List Program with the issuance of the full power Operating License in January of 1987. Reviews conducted of this list at that time, and during subsequent revisions of the procedure which controls the list, did not identify this discrepancy because the plant drawings which identify the amperage rating of the breaker had not yet been revised to reflect the design change.

Since the breaker was upsized prior to licensing of the plant, the affected circuit did not comply with the Technical Specifications.

No previous similar events have been reported.

Safety Significance:

Overcurrent protection of containment penetration conductors is required to ensure that potential electrical faults are interrupted before the resultant high currents could cause damage to the penetration, and potentially compromise the mechanical integrity of the penetration. Redundant protective devices are provided by plant design for each power circuit which penetrates containment, in accordance with plant commitments to Regulatory Guide 1.63, "Electric Penetration Assemblies in Containment Structures for Water-Cooled Nuclear Power Plants, Revision 2", and IEEE Standards 317-1976 and 279-1971, as described in the Final Safety Analysis Report Sections 8.3.1.1.2.15 and 8.3.1.2.11.

This design error resulted in the inoperability of only the backup protection for circuit 1B311-SB-3. The primary protection, provided by fuses for each individual load of the circuit, were in place at all times. The backup protection device would be required to function only if a fuse would have failed shorted. The probability of such a failure is considered highly unlikely. No challenges to the circuit have occurred since initial plant operation.

The discrepancy in breaker size did not affect the ability of the circuit to provide adequate power to the safety-related loads powered from this circuit, which are solenoid valve power and control circuits for various sample valves, vent valves, and steam generator blowdown valves.

This event is reported as a non-compliance with the requirements of Technical Specifications per 10CFR50.73 (a) (2) (i) (B).

Corrective Actions:

1. Circuit 1B311-SB-3 was redesigned to provide fuses as the backup protection device for the penetration conductors.

2. The Technical Specification Equipment List Program was revised to remove this circuit from the list of containment penetration conductor overcurrent protection devices, because a breaker is no longer used as protection for this circuit.

3. Additional reviews of similar circuits are being conducted to ensure other discrepancies do not exist. No further problems have been discovered at this time.

4. Plant power distribution drawings are being revised to indicate breakers used as protection device for the containment penetration conductors.

EIIS Codes:

Containment Electrical Penetrations	(No EIIS Code Listed)
Low Voltage Power System	ED